

Recognition of new taxa in *Grevillea* (Proteaceae: Grevilleoideae) from south-west Western Australia

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Abstract

Olde, P.M. & Marriott, N.R. Recognition of new taxa in *Grevillea* (Proteaceae: Grevilleoideae) from south-west Western Australia. *Nuytsia* 18: 223–234 (2008). In this paper we recognise one new *Grevillea* species, *Grevillea hislopii* P.M.Olde & N.R.Marriott and two new subspecies, *Grevillea althoferorum* P.M.Olde & N.R.Marriott subsp. *fragilis* P.M.Olde & N.R.Marriott and *Grevillea bracteosa* C.F.Meisn. subsp. *howatharra* P.M.Olde & N.R.Marriott. All taxa occur in south-west Western Australia. Morphological analysis suggests that the taxa are not closely related. Interspecific and intraspecific keys are provided and affinities are discussed where relevant. Some of the taxa have a conservation priority and Conservation Codes are provided in all cases.

Introduction

Descriptions of three new taxa in the genus *Grevillea* R.Br. are formally presented. Two taxa, *G. hislopii* and *G. althoferorum* subsp. *fragilis* P.M.Olde & N.R.Marriott, were discovered after completion of three recent revisions of the genus (McGillivray & Makinson 1993; Olde & Marriott 1994a, 1994b, 1994c, 1995a, 1995b; Makinson 2000). Olde and Marriott (1995a: 70) informally recognised a ‘small-conflorescence form’ in *Grevillea bracteosa* Meisn. which has been included in subsp. *bracteosa* in this treatment. The descriptions closely follow the format and terminology used by D.J. McGillivray and Makinson (1993) though some modifications and changes have been incorporated, following Hewson (1988) and Hickey (1973). Methods of working, additional characters and clarifications of morphological terminology have been outlined in Olde and Marriott (1993a, 1993b, 1994a, 1994b, 1994c, 1995a, 1995b, 2002). Special mention must be made here of the contribution of Mr Fred and Mrs Jean Hort whose dedicated voluntary work has resulted in the discovery of all populations of *G. hislopii* and in the discovery of new large populations of *Grevillea bracteosa* subsp. *bracteosa*. All taxa have been studied in the field. Conservation Codes are those used by the Western Australian Department of Environment and Conservation (DEC).

Taxonomy

1. *Grevillea hislopilii* P.M.Olde & N.R.Marriott, *sp. nov.*

Simillima *Grevilleae occidentali* R.Br. sed foliorum pagina inferiore puberulosa, mucrone ligno-brunneo, conflorescentiis minoribus, floribus ad axem versatis, pedicellis brevioribus (usque ad 2.5 mm longum) differt.

Typus: Yarra Road, Western Australia [precise locality withheld for conservation reasons], 5 September 2002, P.M. Olde 02/80 & N.R. Marriott (*holo*: PERTH 07692412; *iso*: K, MEL, NSW, NY).

Seedling (1 specimen examined) based on P.M. Olde 02/80a & N.R. Marriott (NSW). *Cotyledons* 7 mm long, 2.5 mm wide, glabrous, longitudinally wrinkled. *Hypocotyl* 0.5 mm thick, subterete, with moderately dense mixed indumentum of spreading biramous hairs with acute apices and scale-like trichomes with blunt apices. *Seedling leaves* sessile, alternate, simple, entire, obovate, flat; first leaf 1.7 mm long, 5 mm wide, adaxial surface concave, sparsely tomentose, longitudinally wrinkled with prominent reticulum, the midvein obscure; abaxial surface tuberculate with occasional raised simple hairs or minute scales, the midvein protuberant, the reticulum prominent, the margin flat, slightly thickened, partially ciliate; mucro reddish; second leaf similar; third leaf similar but with a moderately dense spreading indumentum more dense on the adaxial surface; fourth leaf with a moderately dense spreading subvillous indumentum on the adaxial surface, the midvein evident; abaxial surface with a dense indumentum of curled hairs intermixed with erect, long straight hairs, the midvein glabrous, evident but more distinct than on the adaxial surface. *Mature plants* moderately dense, rounded, single-stemmed *shrubs* 0.4–1.4 m high, 0.4–1.2 m wide. *Branchlets* angular, glabrous and granulate to scabrous, or with a sparse to dense indumentum of long spreading hairs. *Juvenile leaves* white-villous. *Mature leaves* 1–3 cm long, 1.2–6 mm wide, patent to ascending, sessile to shortly petiolate, simple, linear to very narrowly elliptical; petioles 0–1 mm long, sparsely villous; leaf base linear to narrowly cuneate or attenuate; apex acute or shortly acuminate, the mucro up to 1.5 mm long, pale brown with creamy-yellow base, aristate to blunt, usually straight, slightly brittle, scarcely to non-pungent; margin smoothly recurved to revolute, sometimes enclosing the undersurface on narrower leaves; adaxial (upper) surface granular to scabrid, the asperities sometimes topped by hair bases or by straight or curled biramous trichomes; abaxial (lower) surface with a dense two-state indumentum of mainly short, somewhat appressed, curled or twisted hairs, intermixed with longer, straight, spreading or appressed hairs, these often confined to the midvein which may also be glabrous or almost so; venation of the adaxial surface obscure, on the abaxial surface the midvein protuberant at the base, prominent in the proximal half becoming obscure distally; texture chartaceous to firmly so. *Conflorescences* 0.5–0.8 cm long, c. 0.5 cm wide, terminal, subterminal on short side branches or axillary, often crowded in the upper axils, erect, sessile to shortly pedunculate, simple, subglobose, dense, basipetal; peduncles 0–1.5 mm long, white-villous; rachises 0.5–1 mm long, villous; floral bracts 2–2.5 mm long, 0.7–1.2 mm wide, ovate-acuminate to obovate or sometimes sub-spathulate, apex acute, sparsely villous adaxially, glabrous on the abaxial surface, variably caducous, often some persisting beyond anthesis. *Flower colour* perianth whitish-grey, limb grey-black and slightly rusty; style white with pink surface visible through the indumentum, pollen-presenter green. *Flowers* adaxially oriented, acroscopic; pedicels 1.5–2.5 mm long, villous; torus transverse to slightly oblique to c. 10°, 0.6 mm across; nectary 0.3–0.6 mm high, 0.2–0.3 mm thick, superposed on the torus but usually inconspicuous through tight enclosure by the perianth base, lunate to 2/3 annular, margin bi- to tri-dentate or crenate; perianth 2.5–3 mm long, 0.8–1 mm wide, persistent, coherent except along the dorsal side, rolling down and spreading out to form an oval, almost flat platform below the style, villous abaxially, glabrous on the adaxial surface from the base for 1.2 mm, papillose to c. halfway

grading to subsericeous from about the middle to the limb; basal portion of the perianth coherent after anthesis and closely appressed to the level of the nectary; limb 1 mm long, 1.2 mm across, ovoid, coherent after anthesis; pistil 6 mm long, villous; stipe 0.6 mm long, glabrous; ovary 0.6 mm long, obliquely ellipsoid, densely villous; style angularly infracted, exerted beyond the dorsal outline of the perianth prior to anthesis; pollen-presenter 0.8 mm long, 0.8 mm wide, lateral, round, almost flat; margin 0.1 mm thick, slightly thickened, undulate; stigma central, surmounting a boss-like rise. *Fruits* (*F. Hort* 2752) 7.5–12(–13) mm long, 6.5–7 mm wide, 3.5–4 mm thick; erect on decurved pedicels, narrowly and obliquely ovoid with apex recurved; styles persistent; surface openly villous, long and short hairs intermixed, the hairs evanescent, the revealed surface faintly rugulose and with 5–7 prominent dorsal ribs; pericarp *c.* 0.2 mm across at the suture; texture crustaceous. *Seeds* (*F. Hort* 2608; immature) oblong-obovoid, 5 mm long, 1 mm wide, narrowly marginate along the anterior edge, forming a wrinkled triangular extension *c.* 0.5 mm long and of waxy texture; pulvinus not evident; outer face convex, smooth; inner face flat. (Figure 1)

Selected specimens (27 examined). WESTERN AUSTRALIA: [localities withheld] 5 Oct. 1999, *F. Hort* 646 (CANB, G, P, PERTH 05408326); 11 Sep. 2000, *F. Hort* 1129 (CANB, MEL, PERTH 05678374); 11 Sep. 2000, *F. Hort* 1130 (AD, NSW, PERTH 05694833); 5 Sep. 2005, *F. Hort* 2608 (PERTH 07185499); 14 Dec. 2005, *F. Hort* 2752 & *A. Lowrie* (NSW, PERTH 07247125); 5 Sep. 2002, *P.M. Olde* 02/74 & *N.R. Marriott* (AD, BRI, CANB, NSW, US).

Distribution. Western Australia, in State Forests west of York (Figure 2).

Habitat and ecology. Grows in granite hills in open sunny positions above drainage and creek lines. Soils are clay loam with laterite. Associated species vary at each site but consist generally of species associated with wandoo open woodland. Associated species recorded (*F. Hort* 2608) at one site included *Allocasuarina huegeliana*, *Acacia pulchella*, *Trymalium ledifolium*, *Banksia dallanneyi* and *Cryptandra arbutiflora*.

Flowering period. Spring.

Fruiting period. Not known, probably late October.

Conservation status. Known from four populations, at three of which it is abundant. We do not consider that there is an urgent conservation imperative for this species. Recently listed as Priority Two under DEC Conservation Codes for Western Australian Flora.

Etymology. Named in honour of Michael Clyde Hislop (1955–), who, as identifications botanist at PERTH, drew our attention to the first collection of this species.

Affinities. *Grevillea hislopii* is included in Group 22 *sensu* Olde and Marriott (1994c: 10). All species of this group were included in the *Buxifolia* Group *sensu* Makinson (2000). *Grevillea hislopii* is most closely related to *G. occidentalis* R.Br. (Brown 1810: 173) which differs in having an appressed indumentum of fine, straight, mutually aligned hairs on the leaf abaxial surface, the mucro black, the conflorescences larger (1.5 cm long, *c.* 3 cm wide), the flowers abaxially oriented, pedicels longer (3.5–10 mm long) and the pollen-presenter oblique at *c.* 50°. *Grevillea hislopii* is also related to *G. umbellulata* Meisn. which has an allopatric but overlapping distribution. *Grevillea umbellulata* differs in having sericeous branchlets, the adaxial surface of leaves smooth, conflorescences with flowers loose (i.e. not in a tight, dense head), narrower floral bracts 0.2–0.7 mm wide, pedicels 3–7 mm long.

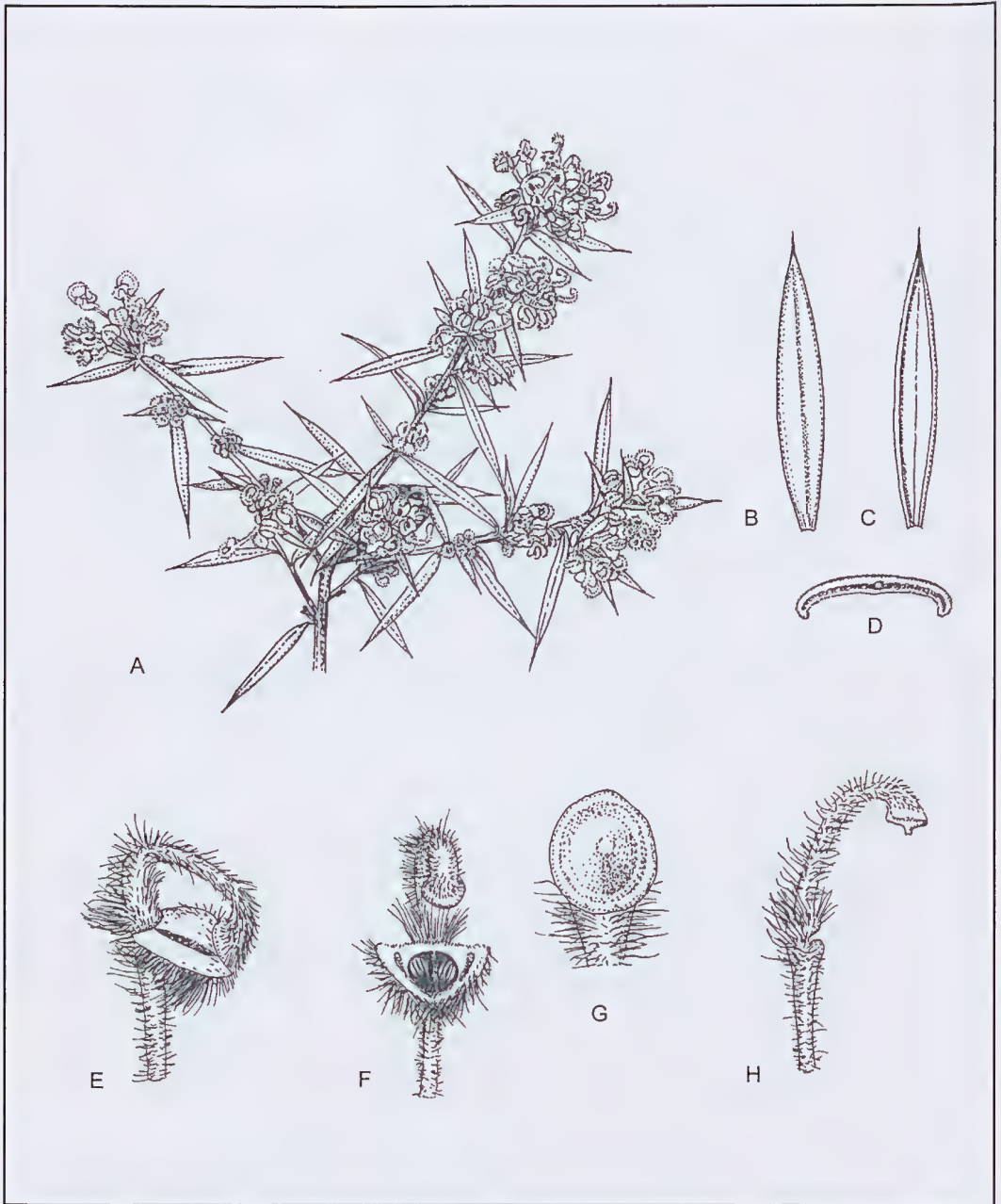


Figure 1. *Grevillea hislopii*. A – habit of plant ($\times 1$); B – adaxial surface of leaf ($\times 2$); C – abaxial surface of leaf ($\times 2$); D – leaf in cross-section ($\times 2$); E – perianth and pistil just prior to anthesis ($\times 4$); F – perianth and pistil post-anthesis ($\times 4$); G – pollen-presenter ($\times 12$); H – pistil ($\times 4$).

Revised key to Group 22 *sensu* Olde and Marriott (1994c)

1. Style-end red, yellow or orange; style-end either glabrous or papillose or if hairy, then with a glabrous or papillose appendage
 2. Stylar appendage incurled; stigma extending inconspicuously from the pollen-presenter ≤ 0.2 mm; pollen-presenter concurrent with the ventral side of the style-end
 3. Apex of stylar appendage papillose; leaf upper surface scabrous; base of pollen presenter projecting from line of style; style strongly incurved..... **G. scabra**
 - 3: Apex of stylar appendage glabrous; leaf upper surface usually smooth; base of pollen presenter concurrent with style; style \pm straight..... **G. candolleana**
 - 2: Style-end either lacking an appendage or if present then the appendage not incurled; stigma conspicuous, extending 0.3–0.4 mm from face of pollen presenter; pollen-presenter raised or protuberant from the ventral side of the style-end
 4. Style-end glabrous and smooth; leaves not fasciculate..... **G. pilulifera**
 - 4: Style-end papillose or with a dense indumentum of short erect trichomes; leaves fasciculate or not
 5. Distal edge of pollen-presenter level with or exceeding apex of style-end; dorsal tepals lacking a small auricular lobe on posterior edge just below the limb cup; leaf margins angularly refracted about the intramarginal vein..... **G. uncinulata**
 - 5: Distal edge of pollen-presenter overtopped by a short beaked extension of the style-end; dorsal tepals with a small auricular lobe on posterior edge just below the limb cup; leaf margins smoothly recurved to revolute..... **G. florida**
- 1: Style-end grey or pinkish or purplish grey, hairy; appendage hairy if present
 6. Leaf adaxial (upper) surface smooth..... **G. umbellulata**
 - 6: Leaf adaxial surface granular to scabrous
 7. Flowers abaxially oriented; pedicels with rusty hairs or not
 8. Leaf abaxial (lower) surface sericeous, all hairs \pm of equal length
 9. Mature fruits 8–12 mm long; perianth mostly greyish-white with brown hairs restricted to the limb; pollen-presenter broad-elliptic to round..... **G. occidentalis**
 - 9: Mature fruits 14–25 mm long; perianth mostly rusty outside; pollen-presenter narrow-elliptic..... **G. sphacelata**
 - 8: Leaf abaxial surface either not sericeous or sericeous but with both short and long hairs intermixed
 10. Leaf abaxial surface with a one-state villous indumentum of long, robustly descending dark hairs; stylar appendage antrorse < 1 mm long..... **G. phyllicoides**
 - 10: Leaf abaxial surface two-state, usually with a number of short and long hairs intermixed; appendage 0.7–2.5 mm long, erect to retrorse..... **G. buxifolia sens. lat.**
 - 7: Flowers adaxially oriented; pedicels lacking rusty hairs
 11. Pedicels < 3 mm long; pistils < 7 mm long; pollen-presenter distinctly rimmed; leaf mucro aristate, finely pointed..... **G. hislopii**
 - 11: Pedicels 5–9 mm long; pistils 9–12 mm long; pollen-presenter not rimmed; leaf mucro short and blunt..... **G. acerata**

The key to the *Buxifolia* Group *sensu* Makinson (Makinson 2000: 328) may be altered by insertion of an additional couplet in the following way.

9. Leaf upper surface smooth **G. umbellulata**
 9: Leaf upper surface granular-scabrid
 9a. Flowers adaxially oriented..... **G. hislopilii**
 9a: Flowers abaxially oriented..... **G. occidentalis**

2. *Grevillea althoferorum* P.M.Olde & N.R.Marriott, in *Nuytsia* 9(2): 295–297 (1993b), as ‘althoferi’.

Type: near Eneabba, Western Australia [precise localities withheld for conservation reasons] 15 September 1991, P.M. Olde 91/102 (*holo*: NSW; *iso*: PERTH 02690780, PERTH 04700120).

A full description is included in Olde & Marriott (1993b: 295–297).

Affinities. *Grevillea althoferorum* is a member of Group 41 *sensu* Olde and Marriott (1994c: 221) which is equivalent to the *Rudis* Group *sensu* Makinson (2000). This distinctive group comprises five species; *G. althoferorum*, *G. pulchella* (R.Br.) Meisn., *G. rudis* Meisn., *G. stenostachya* C.A.Gardner and *G. tenuiflora* (Lindl.) Meisn. All species in this group have actinomorphic perianths, the outer perianth surface with glandular hairs (except *G. stenostachya*), hairy ovary with some or all hairs glandular, style with a sigmoid fold around halfway, distal half of style below the pollen-presenter gradually dilated and either granulose, tuberculose or papillose and fruits with glandular hairs. The style characters are unique within *Grevillea* and comprise a synapomorphy for the group.

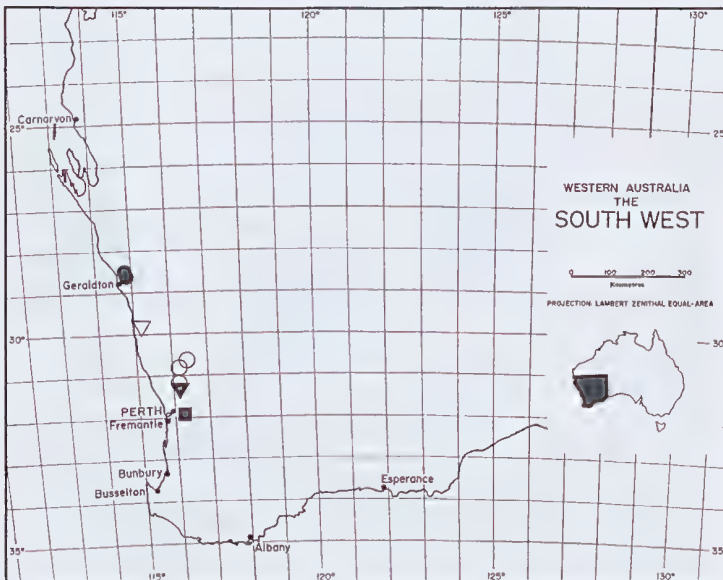


Figure 2. Distribution of *Grevillea hislopilii* (■), *G. althoferorum* subsp. *althoferorum* (▽), *G. althoferorum* subsp. *fragilis* (▼), *G. bracteosa* subsp. *bracteosa* (○), *G. bracteosa* subsp. *howatharra* (●) in south-west Western Australia.

In at least two species (*G. rudis* and *G. stenostachya*), flowering continues over more than a single season with flowers and fruits frequently present on the same rachis, a character-state unique in *Grevillea*. This character-state may also be present in *G. althoferorum* which has an extended flowering season, but fruit-set is very low (fruits and seeds not yet seen). McGillivray and Makinson (1993: 395) have also observed of *G. stenostachya* that 'the inflorescence is sometimes interrupted by a leaf', an unusual character observed in one other unrelated species (e.g. *G. alpina* Lindl.). The group appears to have no close relatives. There is remote affinity with our Group 1 (*Triloba* Group *sensu* Makinson 2000) through the small, white to creamy, actinomorphic perianths, and the presence of stylar dilation (albeit quite different in character), and our Group 7 (*Petrophiloides* Group *sensu* Makinson) through the actinomorphic perianth and glandular fruits. Floral abnormalities have been observed in *G. pulchella* by McGillivray and Makinson who reported flowers with five tepals and some with three (McGillivray & Makinson 1993: 394).

There are two ecogeographically and morphologically distinct populations of *G. althoferorum*, the most southerly being recognised and described here as subsp. *fragilis* P.M.Olde & N.R.Marriott.

Note. Primary leaf lobes have been measured at the subapical sinus, just below the point where the lobes divide.

Key to subspecies

1. Leaf lobes 1–3 cm wide; longest terminal spines 2.5–3.5 mm long, rigid, pungent; perianth limb 1.5–2 mm wide with creamy hairs; pollen-presenter *c.* 0.8 mm long subsp. **althoferorum**
- 1: Leaf lobes 0.25–0.35(–0.5) cm wide; longest terminal spines 0.5–1.5 mm long, brittle, scarcely pungent; perianth limb 1–1.25 mm wide with white hairs; pollen-presenter 0.8–1.5 mm long subsp. **fragilis**

Grevillea althoferorum subsp. **althoferorum**

Primary leaf lobes (see *Note* above) 0.5–1.3 cm wide; longest spines of leaves and leaf lobes 2.5–3.5 mm long, rigid, pungent; perianth 5–6 mm long, 1.5–1.8 mm wide, densely glandular-villous abaxially with cream to brownish-cream hairs; perianth limb 1.5–2 mm long, 1.5–2 mm wide; stylar dilation *c.* 0.4 mm wide at its widest point; pollen-presenter distinctly rimmed at base, *c.* 0.8 mm long, 0.6–0.7 mm wide.

Specimens examined. See Olde and Marriott (1993b: 296).

Distribution. Known from a solitary small population south-west of Eneabba (Figure 2).

Habitat and ecology. Grows in grey sand over laterite in open kwongan dominated by *Grevillea bififormis* subsp. *cymbiformis*, *Grevillea shuttleworthiana* subsp. *canarina* and *Eucalyptus* sp. aff. *tetragona*.

Conservation status. Listed as Declared Rare Flora under the Western Australian *Wildlife Conservation Act 1950* with a ranking of Threatened (Atkins 2008) at the species level.

Grevillea althoferorum* subsp. *fragilis P.M.Olde & N.R.Marriott, *subsp. nov.*

Ab subspecie typica foliorum lobis minoribus spinis brevioribus fragilibus, perianthii limbo minore, trichomis albis, pollinis praebitore longiore differt.

Typus: Bullsbrook, Western Australia [precise locality withheld for conservation reasons], 6 September 2002, P.M. Olde 02/84 & N.R. Marriott (*holo*: PERTH 07692439; *iso*: CANB, K, MEL, NSW 535800, NY, PERTH 07692420).

Primary leaf lobes (see *Note* above) 0.25–0.35(–0.5) cm wide; longest spines of leaves and leaf lobes 0.5–1.5 mm long, brittle, scarcely pungent; perianth 6–7 mm long, 1 mm wide, densely glandular-villous abaxially with white hairs; perianth limb 1.5 mm long, 1–1.25 mm wide; stylar dilation *c.* 0.25 mm wide at its widest point; pollen-presenter distinctly rimmed at base, 0.8–1.5 mm long, 0.35–0.6 mm wide. (Figure 3)

Distribution. Known only from a small population at Bullsbrook.

Habitat and ecology. Grows in deep yellow sand in *Banksia*–*Corymbia* woodland with *Corymbia calophylla*, *Banksia menziesii*, *B. attenuata*, *B. grandis*, *Adenanthos cygnorum*, *Hibbertia* sp., *Ptilotus manglesii*, *Xanthorrhoea* sp., *Mesomelaena tetragona*, *Stirlingia latifolia*, *Lobelia* sp., *Isopogon* spp. and *Petrophile* spp.

Flower colour. Perianth yellow with reddish to reddish-brown buds.

Flowering period. Spring

Fruiting period. Unknown (no fruits have been seen).

Conservation status. Listed as Declared Rare Flora under the Western Australian *Wildlife Conservation Act 1950* with a ranking of Threatened (Atkins 2008) at the species level. Subsp. *fragilis* is known only from the population at the type location where there are approximately 50 plants.

Etymology. Taken from the Latin *fragilis* – brittle, a reference to the brittle spines terminating the leaf lobes.

3. *Grevillea bracteosa* Meisn. in J.G.C.Lehmann, *Plantae Preissianae* 2: 254 (1848).

Type: Western Australia: Swan River *Drummond* coll. 3 no. 269 (*holo*: NY (photo seen); *iso* [*vide* Makinson 2000: 187 which differs substantially from McGillivray and Makinson 1993: 409] BM *n.v.*, K *n.v.*, LE (*n.v.*), MEL 47006, NY (photo seen), P *n.v.*, PERTH 02648709).

Description. McGillivray and Makinson (1993: 375) and Olde and Marriott (1995a: 69–70) provide a comprehensive broad description of the species.

Affinities. *Grevillea bracteosa* has an uncertain relationship with *G. scapigera* A.S.George with which it shares some floral features. In our scheme (Olde & Marriott 1994c: 189–221) we kept these two taxa in separate single-species groups of uncertain affinity (Groups 36 & 37). Subject to DNA analysis it is



Figure 3. *Grevillea althoferorum* subsp. *fragilis*. A – habit of plant ($\times 1$); B – perianth prior to anthesis ($\times 4$); C – pistil ($\times 4$), D – pistil showing nectary at base ($\times 8$); E – perianth after anthesis in relation to the pistil ($\times 4$); F – leaf ($\times 2$).

possible that these two groups will be combined. More recently Makinson (2000) has included both species in his *Hakeoides* Group which superficially to us appears to render that group polyphyletic.

Discussion. McGillivray and Makinson (1993: 375) noted that the ‘flowers are smaller in collections from the southern parts of the species’ range’. Plants from this part of the range were recognised as the ‘small-conflouescence form’ by Olde and Marriott (1995a: 70). It was later realised that this form was entirely consistent with the type specimen and it is therefore included here in subsp. *bracteosa*. Our studies have shown that morphological differences in relation to conflouescence size correlate with geographic and ecological differences. Two subspecies are accordingly recognised.

Key to subspecies

1. Floral rachis 3–5 mm long; pedicels 0.18–2.5 mm long; swollen portion of style-end 0.75 mm thick..... subsp. **bracteosa**
- 1: Floral rachis 8–12 mm long; pedicels (3.25–)4–5.75 mm long; swollen portion of style-end 1–1.75 mm thick.....subsp. **howatharra**

Grevillea bracteosa subsp. **bracteosa**

The ‘small-conflorescence’ form *sensu* Olde and Marriott (1995a: 70).

Unit conflorescence 1.3–1.5 cm wide, dense; floral bracts 4–7.5 mm long, 5–7 mm wide; floral rachis 3–5 mm long; pedicels 0.18–2.5 mm long; pistil 15.5 mm long; ovarian stipe 5 mm long; swollen portion of style-end 2.25–2.5 mm long, 0.75 mm thick.

Selected specimens (30 examined). WESTERN AUSTRALIA: [localities withheld for conservation reasons] 15 Sep. 1999, *J.W. Horn* 2477 (PERTH 05643201); 12 Oct. 2005, *F. Hort* 2637 (NSW, PERTH); 9 Nov. 2005, *F. Hort* 2688 (NSW, PERTH); 21 Jan. 2006, *F. Hort & J. Hort* 2771 (NSW, PERTH); 3 Oct. 1996, *F. Mansfield* 1 (PERTH 04662822), 10 Sep. 1986, *P.M. Olde* 86/343 (NSW 534828); 10 Sep. 1986, *P.M. Olde* 86/882 (NSW 534830); 10 Sep. 1986, *P.M. Olde* 86/883 (NSW 534829); 21 June 2006, *P.M. Olde* 06/02 & *F. Hort* (NSW); 12 Sep. 2004, *P.M. Olde* 04/65 & *D. Shiells* (NSW, PERTH); 19 Oct. 1999, *L. Polomka & S. Patrick* SP 3289 (PERTH 05541018); 30 Nov. 1990, *B.H. Smith s.n.* (CANB, HO, MEL 2015483, S); Oct. 1934, *H. Steedman s.n.* (PERTH 02357674).

Distribution. Western Australia, between southern side of Bindoon Training Area, Toodyay, to the Babilion Range and Mogumber in the west, from east of Miling to Dalwallinu in the north and north-east, from Gabalong to Bindi Bindi in the east (Figure 2).

Habitat and ecology. Grows in open heath in yellow granite-derived sandy clay-loam with laterite.

Flowering period. Spring.

Fruiting period. Late spring.

Conservation status. Listed as Declared Rare Flora under the Western Australian *Wildlife Conservation Act 1950* with a ranking of Threatened (Atkins 2008) at the species level. Recent discovery of at least five populations, one with almost 2000 individual plants, in the Bindoon Army Training Area and adjacent areas of the proposed Julimar Conservation Park by Mr Fred Hort, now suggests that this subspecies has a lower conservation priority and its current status may warrant review.

Notes. White-flowered and deep pink to mauve-pink flowered plants have been recorded from the population on private property east of Miling. These plants have great horticultural potential.

Grevillea bracteosa subsp. **howatharra** P.M.Olde & N.R.Marriott, *subsp. nov.*

Ab subspecie *bracteosa*, conflorescentiis latioribus, rachididibus, bracteis florum, et pedicellis longioribus, apice styli crassiore differt.

Typus: Moresby Range, Western Australia [precise locality withheld for conservation reasons] *s. dat.*, D. & N. McFarland 1131 (*holo*: NSW 620583; *iso*: PERTH 01645994).

Unit confluence 2 cm wide, moderately dense to open; floral bracts 8.5–10 mm long, 4.5–5 mm wide; floral rachis 8–12 mm long; pedicels (3.25–)4–5.75 mm long; pistil 16.2–21 mm long; ovarian stipe 5–6.5 mm long; swollen portion of style-end 2.5–3.25 mm long, 1–1.75 mm thick.

Selected specimens (27 examined). WESTERN AUSTRALIA: [localities withheld for conservation reasons] 3 Dec. 1961, Beard & Lullfitz L25 (NSW 82905); 17 Sep. 1971, A.C. Burns 94 (PERTH 02357720); Sep. 1963, E. Duffield *s.n.* (PERTH 02357739); 13 Sep. 1977, A.S. George 14867 (NSW 620584, PERTH 1646028); 9 Sep. 2002, P.M. Olde 02/118 & N.R. Marriott (NSW 535348); 30 Sep. 1962, M.E. Phillips (CANB, NSW 118476).

Distribution. Western Australia, in three small areas north, east and north-east of Geraldton.

Habitat and ecology. Grows in heavy soils in open sunny positions. Soils are clay loam with laterite. Associated species include *Grevillea pinaster* Meisn.

Flowering period. Spring.

Fruiting period. Late spring.

Conservation status. Listed as Declared Rare Flora under the Western Australian *Wildlife Conservation Act 1950* with a ranking of Threatened (Atkins 2008) at the species level. Subsp. *howatharra* is known from few localities, at none of which it is abundant, and its conservation status should remain unchanged.

Etymology. Named for Howatharra Reserve wherein grows this subspecies at its most northerly distribution. The epithet is used as a noun in apposition and is not declinable.

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